

CHAPTER 2

HAZARD IDENTIFICATION

The hazard identification step identifies those chemicals that contribute to the majority of exposure and risk at a Superfund site. The “contaminants of potential concern” (COPCs) are chemicals chosen because of their occurrence, distribution, fate, mobility and persistence in the environment. Each chemical’s concentration and toxicity is also considered. Algorithms, permeability constants and other parameter values presented in this guidance supersede the dermal methodology provided in *DEA* and the *Risk Assessment Guidance for Superfund (RAGS, U.S. EPA, 1989)*.

2.1 CHOOSING CONTAMINANTS OF CONCERN FOR THE DERMAL-WATER PATHWAY

Consideration of the dermal exposure pathway is important in scoping and planning an exposure and risk assessment. The assessor should decide the level (from cursory to detailed) of analysis needed to make this decision. The screening procedure presented in Section A.4 of Appendix A analyzes whether or not the dermal exposure route is likely to be significant compared to the other routes of exposure. This discussion is based on the methodology in the *DEA*, Chapter 9, using parameters provided in this guidance. Readers are encouraged to consult the *DEA* document for more details. The screening procedure in Section A.4 is intended to focus attention on specific chemicals that may be important for dermal exposure and is provided for the convenience of the risk assessor. However, risk assessors may decide not to use the screening and proceed to a quantitative assessment of all chemicals at a site.

Exhibit B-3 in Appendix B provides the results of applying the Appendix A screening procedure to identify organic chemicals that contribute significantly to the risk at a site for the dermal route. For this guidance, the Superfund Dermal Workgroup

decided that the dermal route is significant if it contributes at least 10% of the exposure derived from the oral pathway. These results are based upon comparing two main household daily uses of water, as a source for drinking and for showering or bathing. This screening procedure is therefore limited to residential exposure scenarios where both ingestion and showering/bathing are considered in the site risk assessment. The screening procedure does not consider swimming exposures, and thus should not be used for screening chemicals in surface water where exposure may be through swimming activity. However, if swimming is an actual or potential exposure scenario in the site risk assessment, dermal exposure should be quantitatively evaluated, using input parameters described in the document.

Note that the results of this screening procedure are the actual results of a quantitative exposure assessment for these two routes of exposure. All calculations needed for the evaluation of DAD for water, as described in Chapter 3 and in Appendices A and B, were performed for the list of chemicals presented in Exhibit B-3 and Exhibit B-4, using the exposure conditions specified in each exhibit. These exhibits are provided as a screening tool for risk assessors to focus the dermal risk assessment on those chemicals that are more likely to make a contribution to the overall risk.

The example screening results are provided in two columns in Exhibit B-3 and Exhibit B-4: the column labeled “Derm/Oral” gives the actual ratio of the dermal exposure route as compared to the ingestion route (two liters of drinking water), and the column labeled “Chem Assess” gives the result of the comparison as a Y (Yes) or N (No) using the 10% criterion discussed above. When these default exposure assumptions are not appropriate, stepwise instructions are provided in Chapter 3 and Appendix B to incorporate site-specific exposure parameters.

2.2 CHOOSING CONTAMINANTS OF CONCERN FOR THE DERMAL-SOIL PATHWAY

The number of contaminants evaluated in the risk assessment for the dermal-soil pathway will be limited by the availability of dermal absorption values for chemicals in soil. Very limited data exist in the literature for the dermal absorption of chemicals from soil. Chapter 3 provides recommended dermal absorption factors for ten chemicals in soil based on

well designed studies. If a detected compound does not have a dermal absorption value presented in Chapter 3, other sources of information, such as new exposure studies presented in the peer reviewed literature or site-specific *in vitro* and *in vivo* studies, may be considered to estimate a dermal absorption value. The EPA risk assessor should be consulted before conducting site-specific dermal absorption studies, to ensure that a scientifically sound study is developed and approved by the Agency.